PATENT CLAIMS

1. Process for the preparation of perfluoroalkylphosphines, characterised in that it comprises at least the reaction of at least one fluoro(perfluoroalkyl)phosphorane with at least one hydride ion donor.

2. Process according to Claim 1, characterised in that the fluoro(perfluoroalkyl)phosphorane employed is a compound of the general formula I

$$(C_nF_{2n+1})_mPF_{5-m}$$

I

in which $1 \leq n \leq 8$, preferably $1 \leq n \leq 4$, and m is in each case 1, 2 or 3.

3. Process according to Claim 1 or 2, characterised in that the fluoro(perfluoroalkyl)phosphorane employed is a compound selected from the group consisting of difluorotris(pentafluoroethyl)phosphorane, difluorotris(n-nonafluorobutyl)phosphorane, trifluorobis(n-nonafluorobutyl)phosphorane and difluorotris(n-heptafluoropropyl)phosphorane.

4. Process according to one of Claims 1 to 3, characterised in that the reduction is carried out without a reaction medium.

5. Process according to one of Claims 1 to 4, characterised in that the hydride ion donor is a compound selected from the group consisting of hydrosilanes, alkylhydrosilanes, metal hydrides, borohydrides and hydroborates.

6. Process according to Claim 5, characterised in that the alkylhydrosilane is triethylsilane or tripropylsilane.

7. Process according to Claim 5, characterised in that the borohydride is sodium borohydride.

8. Process according to one of Claims 1 to 7, characterised in that the hydride ion donor is employed in an equimolar amount or in excess, in each case based on the amount of fluoro(perfluoroalkyl)phosphorane employed.

9. Process according to one of Claims 1 to 8, characterised in that the reaction mixture is refluxed during the reaction.

10. Process according to one of Claims 1 to 9, characterised in that the duration of the reaction is from 0.5 to 20 hours, preferably from 1 to 15 hours.

11. Process according to one of Claims 1 to 10, characterised in that the perfluoroalkylphosphine(s) is (are) purified by distillation, preferably under an inert-gas atmosphere, if desired under reduced pressure.

12. Use of at least one tris(perfluoroalkyl)phosphine for the perfluoroalkylation of chemical substrates.

13. Use according to Claim 12, characterised in that the perfluoroalkylation is carried out in the presence of a base.

14. Use according to Claim 12 or 13, characterised in that the substrates employed are organic compounds, preferably tricoordi-

nated organoboron compounds and/or organic compounds containing carbonyl groups.